



## *EPA Region 7 TMDL Review*

<i>TMDL ID</i>	237	<i>Water Body ID</i>	IA 02-CED-0160-0
<i>Water Body Name</i>	Mud Creek		
<i>Pollutant</i>	Organic Enrichment		
<i>Tributary</i>	IA 02-CED-0160-0		
<i>State</i>	IA	<i>HUC</i>	07080206
<i>Basin</i>	Cedar River Basin		
<i>Submittal Date</i>	6/19/2003		
<i>Approved</i>	yes		

### **Submittal Letter**

*State submittal letter indicates final TMDL(s) for specific pollutant(s)/ water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act.*

The submittal letter was dated June 16, 2003 and received June 19, 2003.

### **Water Quality Standards Attainment**

*The water body's loading capacity for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards.*

Mud Creek is on the impaired waters list for organic enrichment caused by both point and non-point pollutant sources. Organic enrichment has depressed dissolved oxygen concentrations in the water column. Two water quality targets are established in this TMDL, a reduction in the oxygen demand, and an unimpaired biological community. Dissolved oxygen criteria are established under protected low flow conditions. This is a phased TMDL with both watershed and point source improvements necessary to ensure ultimate compliance with the water quality standards.

**Numeric Target(s)**

*Submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.*

The beneficial use is Aquatic Life B(LR). The Dissolved Oxygen endpoints is determined based upon stream criteria and in this instance is 5 mg/l. In addition, a second water quality target is in place requiring an unimpaired biological community as determined using the bioassessment procedures and criteria that established the impairment.

**Link Between Numeric Target(s) and Pollutant(s) of concern**

*An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety that do not exceed the load capacity.*

To meet the TMDL endpoint of 5 mg/l dissolved oxygen at protected flow, oxygen demand from both point and nonpoint sources need to be reduced by the difference between the existing loads and the allocated loads. Ammonia and BOD from point sources create significant oxygen demand on receiving waters. Non point sources also add material to the stream which result in sediment oxygen demand which is further exacerbated by low stream gradient.

**Source Analysis**

*Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, non point and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered.*

The source of organic enrichment within Mud Creek is of both point and non-point source origin. Ninety percent of the watershed is in agricultural production, 80% of this amount is intensely row cropped. Sediment accumulation has been identified as a primary cause of the biological impairment. Accelerated streambank erosion and organic waste input from livestock grazing in or near the stream are also sources identified as contributing to the poor water quality.

Natural background was not separated from the total non-point source load. There are three significant permitted point sources continuously discharging directly into Mud Creek, two of which have received significant upgrades since the last assessment. There are no NPDES permitted livestock feeding operation in the watershed. Other minor point source exist but don't discharge either ammonia or BOD at critical flow conditions.

**Allocation**

*Submittal identifies appropriate wasteload allocations for point, and load allocations for nonpoint sources. If no point sources are present the wasteload allocation is zero. If no nonpoint sources are present, the load allocation is zero.*

Organic enrichment is a problem tied to low dissolved oxygen concentrations caused by point and nonpoint sources. Allocation were performed by modeling the stream with QUAL2E targeting a critical low flow of 1 cfs (as provided by existing State of Iowa Water Quality Standards.) The model loads were set to ensure that the 5 mg/l DO standard was not violated under critical flow conditions.

#### **WLA Comment**

The phase I wasteload allocation for the three plants are based on a protected flow of 1 cfs and an SOD reduction of 50%. The target WLA for the three plants are as follows:

Walcott (NH3N (#/day): summer 12.8, winter 39, spring/fall 17 and CBOD5 (#/day): year round 107.)

Durant (NH3N (#/day): summer 3.3, winter 10.8, spring/fall 10 and CBOD5 (#/day): year round 42.)

Wilton (NH3N (#/day): summer 5.8, winter 26.3, spring/fall 2.9 and CBOD5 (#/day): year round 73.)

#### **LA Comment**

The phase I load allocation for total SOD and low flow continuous NPS oxygen demand is 68 pounds per day (a 50% reduction).

#### **Margin of Safety**

*Submittal describes explicit and/or implicit margin of safety for each pollutant. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided.*

The margin of safety is implicit, using the conservative assumptions of targeting dual endpoints: a reduction of oxygen demanding substances and achieving biological integrity.

#### **Seasonal Variation and Critical Conditions**

*Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s).*

The "critical condition" is the phase I protected low flow of 1 cfs. Targets were set for three seasonal conditions: summer, winter, and spring/fall.

#### **Public Participation**

*Submittal describes public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s).*

Public meetings were held on January 14, 2002 and January 28, 2002. Public Notice was between March 20th and April 11, 2003. Other public participation efforts were described in the TMDL. Draft versions were available on the Internet, and copies were distributed to stakeholders. Public comment was received and incorporated as appropriate.

#### **Monitoring Plan for TMDL(s) Under Phased Approach**

*The TMDL identifies the monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used).*

This is a phased TMDL. The monitoring plan has 4 parts: measurement of sediment oxygen demand, a biological assessment, additional watershed modeling, and continuous flow and DO measurements. The majority of this work is to be completed in 2003 and 2004. A phase I project report will be prepared by IDNR by March of 2004.

**Reasonable assurance**

*Reasonable assurance only applies when reduction in nonpoint source loading is required to meet the prescribed waste load allocations.*

Assurance is provided through a EPA funded 319 assessment and subsequent implementation of non-point control measures (Mud Creek Water Quality Project). Project is funded through 2005. If DO / SOD reduction goals are not reached, new allocations will be made.

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